

## Full Spectrum Color Detecting Pixel Camera

Attorney Docket: [CDP Patent APP]

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**Abstract**

This invention comprises the means for the capture of full spectrum images in an electronic camera without the use of color primary filters to limit the spectral color gamut of the captured image. The fundamental principle of the invention is that each pixel of the image sensor acts as an independent spectrophotometer and spectral separator.

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• Electromagnetic energy enters through a slit or collimating optic.
- Electromagnetic energy gets diffracted into component spectra by diffraction grating spectrophotometer for each pixel of image
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• Electromagnetic energy leaves diffraction grating at different angles based on wavelength of the energy
- Spectrophotometer separates light for each pixel into its spectral components onto photodetector line array elements
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• Individual line array elements which are activated determine the original radiance level of the light source containing that specific wavelength region. The sum of these regions determines the spectral signature of the light at that pixel element.
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• Many pixels arranged in a two-dimensional matrix would generate the image frame. Sequencing frames yields a full-spectrum moving image.